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MONTHLY REPORT - APRIL 1979

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NOAA/NMFS

TO OUR READERS:

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STATUS OF PUBLICATIONS

Published

Laurs, R. Michael, Richard Ulevitch and David C. Morrison. 1978. Estimates of blood volume in the albacore tuna, pp. 135-139. In Gary D. Sharp and Andrew E. Dizon (eds.), The physiological ecology of tunas. Academic Press, Inc., New York, N.Y.

Morrison, David C., R. Michael Laurs and Richard J. Ulevitch. 1978. Activity of albacore serum complement reflects its thermoregulatory capacity, pp. 141-150. In Gary D. Sharp and Andrew E. Dizon (eds.), The physiological ecology of tunas. Academic Press, Inc., New York, N.Y.

Parrish, R.H. and A.D. MacCall. 1978. Climatic variation and exploitation in the Pacific mackerel fishery. State of California - Department of Fish and Game - Fish Bulletin 167. 110 p.

In this paper, the authors provide an indepth analysis of the California Current Pacific mackerel (Scomber japonicus) fishery, including descriptions of the fishery and the species population biology, a cohort analysis, density and environmental-dependent spawner-recruit models, and yield simulations. The cohort analysis (1928-1968), using an instantaneous natural mortality rate of M = 0.5, shows a fluctuating stock size with a maximum total biomass of 965 million pounds (438,000 MT) in 1933 and a minimum of 3.3 million pounds (1500 MT) in 1968. The number of recruits-per-spawner shows large fluctuations with considerable coherence between adjacent years. There was no marked downward trend in recruits-per-spawner over the 1928-1968 period. Density-dependent spawner-recruit models accounted for a maximum of 24

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percent of the observed variation in recruitment. Multiple regression models, including both population and environmental variables, were fitted to the data available for two time periods; 1931-68 and 1946-68. The 1931-68 model accounted for 59 percent of the variation in recruitment; increased recruitment was associated with increased sea surface temperature, reduced sea level and reduced atmospheric pressure during the spawning season. The 1946-68 model accounted for 76 percent of the variation in recruitment; increased recruitment was associated with increased coastal upwelling and decreased offshore convergence during the spawning season. Maximum yield-per-recruit occurs with an age at recruitment of 1 or less, and with instantaneous fishing mortalities (F) in excess of 1.0. A dynamic pool model incorporating a Ricker spawner-recruit model predicts that extinction of the stock will occur with the above fishing strategy. Maximum sustained yield (MSY) with the steady state dynamic pool model is above 94 million pounds (41,000 MT). The MSY occurs with an age-at-recruitment of 4 with an exploitation rate of 0.25. Simulations incorporating the density and environmental-dependent spawner-recruit functions predict that the above MSY cannot be attained when there is serial coherence in the annual recruitment fluctuations. Mean long-term annual yield with the above fishing strategy, under the environmental conditions occurring between 1931-68, would have been only 56 million pounds (25,000 MT). With an age-at-recruitment of 1, maximum steady state yield (69 million pounds, 31,000 MT) occurs at an exploitation rate of 0.2. Maximum long-term yield with this fishing strategy, under the 1931-68 environmental conditions, would have been 45 million pounds (20,000 MT).

Sharp, Gary D. and William J. Vlymen III. 1978. The relation between heat generation, conservation, and the swimming energetics of tunas, pp. 213-232. In Gary D. Sharp and Andrew E. Dizon (eds.), The physiological ecology of tunas. Academic Press; Inc., New York, N.Y.

Approved by Center Director

Barham, Eric G. Marine mammals in Monterey Bay, California during the years 1951-1955. For publication in California Fish and Game.

Huppert, D. D. Implication of multipurpose fleets and mixed stocks for control policies. For publication in the Journal of the Fisheries Research Board of Canada.

Translation

Suisan Sekai. 1978. South Pacific Ocean is lashed by the fury of the 200-mile storm (200-kairi taifu, Minami Taiheiyo nami takashi). [In Jpn.] Suisan Sekai 27(9):22-26, (Engl. transl. by Tamio Ostu, 1979, 8 p., Transl. No. 33).

HONOLULU LABORATORY

RESOURCE ASSESSMENT AND DEVELOPMENT INVESTIGATIONS (RADI)

Work Continues on Models Forecasting Skipjack Tuna Catch

Dr. Roy Mendelssohn, Operations Reseach Analyst, and Ms. Lisa Katekaru, Computer Aid at the Honolulu Laboratory, reported that the initial results of their work on constructing models of the skipjack tuna catch in Hawaii are encouraging. Data from January 1964 through July 1977 have been used to estimate preliminary time series models. These models are estimated using an approximate procedure which maximizes the conditional likelihood of the data. Month-by-month forecasts were made for the 17-mo period, August 1977-December 1978, using no additional data. The fits are reasonable, and have almost all the turning points of the observed catch over this period. The estimated total catch for this period was within a 5%-8% deviation of the observed catch.

To improve the forecasts further, the models are presently being estimated using the unconditional likelihood, which often results in significant reductions in the residual sum of squares. Further models that include size classes and environmental variables are being developed.

Working Papers Prepared for Tuna Workshop at Shimizu, Japan

Dr. Jerry Wetherall, Leader of the Fishery Management Research Task, Fishery Biologist Fletcher Riggs, Mathematician Marian Yong, and Fishery Biologist Howard Yoshida worked on various tasks in preparing for the upcoming workshop on the Assessment of Tuna Stocks in the southern, central, and western Pacific and Indian Oceans which will be held in Shimizu, Japan from 13 to 22 June 1979. Riggs has developed a series of computer programs which sort catch and effort files, generate distribution charts to any specified degree of resolution, and compute population distribution statistics, stock abundance indices, concentration coeffficients and a variety of other pertinent statistics under specified stock boundaries. Abundance indices will be produced for South Pacific albacore using the logbook statistics of foreign tuna longliners based at Pago Pago and historical longline statistics published by Taiwan and Japan. A fishing power analysis will permit the amalgamation of abundance indices based on statistics of each nation's longliners. The time series of standardized abundance indices will be used along with historical total catch statistics in a production model analysis of the South Pacific albacore stock.

Yong is compiling albacore size composition data gathered over the years by NMFS samplers and Samoan samplers at the Pago Pago tuna canneries. She has used the data to estimate length-weight relationships and is computing length-frequency distributions by area, time period, vessel nationality, and sex. The sample frequency distributions will be raised by total catch statistics to estimate the total albacore catch by length-class interval.

Besides the extensive analysis of South Pacific albacore statistics, Riggs and Yong will work with Wetherall to generate historical abundance indices for a variety of tuna and billfish species in the Indian Ocean, and to complete exploratory production model analyses of these stocks.

Yoshida is gathering together the available estimates of population parameters for tunas in the South Pacific, western Pacific, and Indian Ocean for a paper which will include information on length-weight relationships, growth rates, and mortality rates for the June workshop.

Fishery Economics Studies Continue

Dr. Michael Adams, Industry Economist, has completed a revised Administrative Report on the economics of the spiny lobster industry in Hawaii. Results from this report also will be used in the Spiny Lobster Fishery Management Plan. The report shows that the minimum feasible catch rate for the industry is between 1 and 2.5 legal lobsters per trap night, and this remains valid over a wide range of discount rates and average lobster sizes.

Adams has also developed some initial models for evaluating the demand for catch rates and fish sizes by species in Hawaii's recreational fisheries. The models are adapted from urban economic studies which use similar techniques to estimate the demand for open space, police services, and the quality of elementary education when explicit prices are not available.

Studies have continued on the fresh fish markets in Hawaii. As a first step in analyzing the industry, producer market shares have been calculated. Linda Hudgins, Economist, has revised her paper on per capita consumption of fish in Hawaii for submission to the Marine Fisheries Review.

FAO-Sponsored Their Fishery Scientists to Train-at-Honolulu Laboratory

Under a fellowship provided by FAO/UN, two Thai fishery trainees, Peerasak Jantarapagdee, Fishery Biologist, and Niyom Lohakarn, Gear Technologist, Department of Fisheries, Thailand, arrived at the Honolulu Laboratory on April 2 to begin a 3-month training program in the Hawaiian skipjack tuna fishery. Thomas Hida, fishery biologist, is acting as program coordinator for the trainees.

Hida assisted Jantarapagdee and Lohakarn to locate suitable housing during their stay in Honolulu and also provided an orientation tour of the city and tours of the Laboratory, Hawaii Division of Fish and Game, and other places of interest. Lohakarn has been assigned to the local tuna boat, Yellowfin, and Jantarapagdee to the Buccaneer.

This training program for the Thai scientists is part of an undertaking by the Government of Thailand and FAO/UNDP to study the feasibility of developing a tuna pole-and-line fishery in southern Thailand. After they complete their training in Hawaii, the two men will return to Thailand and presumably take lead roles in the feasibility study.

Honolulu Laboratory Biologists Attend Tuna Workshop in Indonesia

At the invitation of A. Woodland, Program Leader, United Nations South China Sea Fisheries Development and Coordinating Program (SCS), Dr. Robert A. Skillman, Leader, Resource Monitoring and Assessment Task at the Honolulu Laboratory, attended the workshop on the Tuna Resources of Indonesia and Philippine Waters held in Jakarta, Indonesia on March 20-23, 1979 and also spent 1 week at the SCS offices in Manila. Skillman made the trip in preparation for this forthcoming UN assignment in Manila. Jerry A. Wetherall also attended the workshop as a representative of the Honolulu Laboratory. The Jakarta workshop brought together Indonesian and Philippine workers for the presentation of the latest available information on catches and the status of the regional fisheries and for the exchange of viewpoints on assessment of skipjack and yellowfin tuna stocks, future biological studies, and a future cooperative regional skipjack tuna tagging program. Skillman spent much of the week in Manila preparing for the Tuna Consultation Meeting for Asia and Pacific Region to be held in Manila on June 26-30, 1979 by the SCS. The meeting is being set up to discuss informally options for institutionalizing tuna management and centralizing data storage.

Plans Made to Expand Scope of Fishery Information System

On April 11, 1979 the SWFC's Fishery Information System (FIS) Steering Committee held a meeting to plan the expenditure of the FY 1979 contract reserve funds received for a regional FIS for data management and socio-economic studies. The meeting was attended by Fred Kellenberger, Dave Mackett, and Mark Sullivan from SWFC, La Jolla, Gary Smith from the Southwest Region and Skillman from SWFC, Honolulu. The Center has been developing a regional FIS that has involved designing the system framework, initiating phases of the plan in the area of the Pacific Regional Fishery Management Council by working with the State of California to improve certain aspects of the collection and management of landings data and establishing an enforcement data system (PACES) for the Southwest Region. The current implementation phase of the FIS, as decided at the meeting, will involve: (1) the continuation of the cooperative work with the State of California and (2) the initation of a comparable program into the area of the Western Pacific Regional Fishery Management Council (WPRFMC) by involving the State of Hawaii and the other island governments.

Western Pacific Regional Fishery Management Council (WPRFMC) Seeks Contract for Preparation of Bottomfish Fishery Management Plan

At its last meeting the WPRFMC voted to provide funds to let a contract for the preparation of a fishery managment plan (FMP) for bottomfishes. In this connection, Dr. R. Skillman as Chairman of the Bottomfish Plan Development Team prepared a draft request-for-proposal for release by the Council. The proposed contract objective is to deliver to the Council a complete FMP covering the bottomfish fisheries of American Samoa, Hawaii,

Guam, and Northern Marianas. The proposed outline of the plan provides for the inclusion of biological descriptors of the many species involved, descriptions of the fisheries, economic evaluations, and optimum yield determinations. The intent is to have a single FMP for all of the areas that also addresses the management needs of each of the areas separately as required by the biological, economic, and social realities.

Study of Population Dynamics and Biology of Spiny Lobsters Continues

Dr. Jeffrey Polovina, Statistician, aided by Research Assistant Darryl T. Tagami has been studying the spiny lobster, Panulirus marginatus, stock at Necker Island to determine population size, catchability, and recruitment. In April, they examined all the commercial and research vessel data on lobster fishing, updated and corrected inaccuracies in the data base, and constructed commercial catch and effort files for the period November 1976 to December 1978 for the entire island and by several subareas. Preliminary results of the study on the Necker Island population show that predicted monthly catches and actual monthly catches were significantly correlated.

Research Assistant Victor A. Honda continued to make fecundity determinations for spiny lobsters caught around Necker Island and Maro Reef. Honda reported that of the females examined to date, the smallest female was 67.9 mm in carapace length and had an estimated 143,000 eggs in its external egg mass. The largest female measured 99.4 mm in carapace length, and had 282,000 eggs. According to Honda, the number of eggs produced is not directly proportional to carapace length. In a group of females 85.0 to 90.0 mm in carapace length, Honda found that egg counts varied from 130,000 to 339,000.

Northwestern Hawaiian Islands Cruises Continue

Richard Uchida, Leader, Insular Resources Task at the Honolulu Laboratory, reported that the Townsend Cromwell left Kewalo Basin on March 31 to begin cruise 79-02, a two-part cooperative cruise involving NMFS, University of Hawaii Sea Grant (UHSG), Wildlife Branch, Hawaii Division of Fish and Game (HDFG), and the U.S. Fish and Wildlife Service (USFWS). The major mission of Part I of the cruise, which involves UHSG, is to assess the primary and secondary productivity of the waters of the Northwestern Hawaiian Islands (NWHI). Another objective is to anchor a fish aggregation buoy off Kailua-Kona, Hawaii for the Honolulu Laboratory's fish aggregating project. Research Assistant Robert Humphreys is Chief Scientist on Part I.

Part II, which involves survey and assessment of the wildlife and marine resources under the terms of the Tripartite Cooperative Agreement among NMFS, HDFG, and USFWS, will be conducted at several selected islands and banks in the NWHI.

Fishery Biologist James Uchiyama who will be Chief Scientist on Part II is scheduled to join the Townsend Cromwell at Midway Islands together with Reginald Gooding, Fishery Biologist, and Research Assistant Robert Moffitt.

Experiments to determine the degree of predation on surface-released sublegal and berried female spiny lobsters will be conductd during the cruise. Gooding designed the experiments in response to a request for such data from the Spiny Lobster Plan Development Team.

Northwestern Hawaiian Islands Fishery Observer Project Gains Momentum

Research Assistant Paul M. Shiota continued to coordinate the commercial vessel observer project to monitor the operations of vessels fishing in the NWHI for spiny lobsters and bottom fishes. In April, research assistant Alan Everson served as an observer aboard the FV Easy Rider. After a short turn-around period in port to unload the catch, the Easy Rider returned to the NWHI to continue lobster trapping and handline fishing, with research assistant Bert Kikkawa aboard. Also serving as an observer is research assistant Andrew Aldridge, on the FV Keola. Research assistant Victor A. Honda is standing by to board the FV Libra, which is also preparing to fish in NWHI waters.

Other Northwestern Hawaiian Islands Biological Studies Continue

Research Assistant Robert Moffitt sectioned and read otoliths to begin a study of the age and growth of the grouper, Epinephelus quernus, and Uchiyama began an analysis of length-weight relationships of handline-caught fishes in the NWHI. Analysis of covariance tests on measurement data for kahala, Seriola dumerilii, showed that data for males and females and data from the different cruises could be pooled.

Gooding and Research Assistant Bernard Ito made an aerial photographic survey of the NWHI during the month. All the potential Hawaiian monk seal haul out beaches were photographed. A report of the results of the monk seal aerial survey flights which have been made during the past year is presently being prepared.

Hawaii Skipjack Tuna Landings Continue Below Long-Term Average

The April 1979 Hawaii landings of skipjack tuna were estimated at 178 metric tons (MT), which is 210 MT below the April 1978 landings and 48 MT below the 1948-78 long-term average for April. The cumulative landings from January through April were estimated at 542 MT, which is 238 MT below the 1978 landings for the same period and 62 MT below the 1948-78 long-term average for the same period.

FISH-ENVIRONMENT INVESTIGATIONS (FEI)

Maturing Trend Seen in Ova of Captive Kawakawa

Dr. Andrew Dizon, Leader, Experimental Ecology of Tunas Task at the Honolulu Laboratory, reported that work is continuing in efforts to induce spawning in captive tuna. Dr. Calvin Kaya, visiting scientist from Montana State University, biopsied the kawakawa in tanks D and E on April 17 and 18, respectively. Those in D had been in captivity for nearly 12 weeks and had been biopsied 5 weeks earlier. Those in E had been in captivity for 9 weeks and had been biopsied 4 weeks earlier. Of the 16 fish in D, small amounts of viscous milt were catheterized from 8, ovarian tissue was obtained from 5, and 3 yielded no identifiable gonadal material. Of 18 fish in E, viscous milt was obtained from 1, ovarian material from 12, and 5 yielded no identifiable gonadal tissue. On April 25, 10 kawakawa (Euthynnus affinis) were purchased from fish markets for gonadal samples. These were similar in size to the captive specimens (414 to 467 mm, fork length) at the Kewalo Research Facility. Measurements of 25 ova of the largest size-class in each sample gave the following results.

Mean diameters of largest size-class of ova (mm):

	Date	N	Range	Group median	Group mean
Tank D	4/17	5	0.14-0.30	0.21	0.22
	3/13	4	0.09-0.12	0.11	0.11
Tank E	4/18	12	0.12-0.43	0.18	0.21
	3/20	12	0.10-0.24	0.13	0.14
Wild fish	4/25	10	0.16-0.35	0.23	0.24

Although there is a definite trend toward increasing ova diameters in the captive specimens, the ova are still only a fraction of the 0.6 to 0.7 mm diameter that would have to be attained before attempts to induce ovulation hormonally become feasible. Ovaries of the similar sized wild fish were at a similar stage of development. Although these fish are still in a relatively early stage of development, kawakawa of this same size range sampled this past August did have ovaries in advanced stages of maturation. In order to get maturing fish earlier in the summer, it may be necessary to obtain larger fish; attempts are being made to have such specimens brough in by commercial vessels.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

MULTISPECIES TAXONOMY PROGRAM

Process Determined for Staging and Aging Eggs of the Northern Anchovy

Dr. E. Ahlstrom, Senior Scientist at the La Jolla Laboratory, was asked to determine whether criteria could be developed for the routine staging and aging of northern anchovy eggs (Engraulis mordax), an essential factor in the estimate of biomass. The materials analyzed for this determination were a collection of anchovy eggs made from the research vessel, Scorpius, under contract to NMFS during January/February 1979, using a new type of net specifically devised for vertical sampling of eggs. This net is called a CalVET, an acronym derived from CalCOFI Vertical Egg Tow. It has a mouth area of 0.05 m^2; the size of opening in the straining surface of the net is 0.333 mm mesh and is designed to retain the anchovy egg which is ellipsoidal in shape with an average length of 1.34 mm and width of 0.66 mm.

A series of eight vertical tows were taken at each station during the cruise with a total of 87 stations occupied. Of these, 54 contained moderate to large number of anchovy eggs, 14 contained only a few eggs in some of the hauls, and 19 stations contained 0 anchovy eggs. The basic staging and aging is based on the 54 stations where samples were collected throughout the day and night. Dividing the 24-hour period into quarters of days, 17 stations were occupied between 1800 and midnight, 8 between midnight and 0600, 17 between 0600 and 1200 hours, and 12 between 1200-1800 hours. Both surface and 10-m (bottle) temperatures were taken at each station. The 10-m temperature was used. For the majority of stations the temperature was between 13° and 14° C. From the work of Lasker and Zweifel it was known that anchovy eggs require 4 days to develop from fertilization to hatching at 13° C and 3.4 days at 14° C. Hence all hauls were expected to contain eggs spawned on three different days and many to have eggs from 4 days. The following account on the staging and aging of anchovy eggs was prepared by Dr. Ahlstrom:

Time of Spawning: Anchovy were known to spawn at night, but the precise timing of spawning was not known with any precision, hence one of the objectives of the study was to determine timing of anchovy spawning by determining when newly spawned eggs were obtained in the collections. For each of the eight hauls taken at a station, the exact time of the haul was recorded, in order that individual hauls could be used for determining time of collection of newly spawned eggs. At some stations newly spawned eggs were taken in all or most hauls, while at other stations newly spawned eggs were taken in one to several of the later hauls. The earliest time of collection of newly spawned eggs was 1849 hours; 19 hauls collected between 1849 and 2257 hours contained newly-spawned eggs prior to initiating cell division. Thereafter until 0300 some newly spawned eggs were taken together with developing eggs. For example, between 0000 and 0100 hours, 50% were

undergoing early cell divisions. Between 0100 and 0200 hours the proportion in 13 hauls was 15% newly spawned and 85% developing, and between 0200 to 0300 hours in 11 hauls there were 4% newly spawned and 96% developing. From these data it appears that the peak of spawning is between 2000 to 2400 hours; 2200 hours was selected as the time of peak spawning in order to establish a "0" hour.

Staging and Aging: Inasmuch as most spawning occurs during a 4-hour period during each night, there are marked differences in the stage of development attained by eggs that were spawned 24 hours previously, or 48 hours earlier, or in some instances 72 hours before. There is, therefore, a basis for separating eggs into the several days of spawning represented in each sample. To do this with precision, eggs were also staged. For each station, the temperature and time of collection was available. For example, if the temperature was 13.5° C and the time of collection about 10:00 o'clock, then 4-day eggs could be expected whose average age would be 12 hours, 36 hours, 60 hours, and 84 hours.

Staging: Egg development was divided into 11 stages based on Ahstrom's work (1934) on the Pacific sardine. Stage 1 was limited to newly spawned eggs prior to cleavage. Stage 2 to 5 represented the period of development prior to blastopore closure. Stage 6 was the mid-stage of development beginning at blastopore closure and ending when the tail portion of the embryo started to separate from the yolk. Later stages, 7 through 11, are separated primarily on the degree of development of the free tail; which bends forward and grows toward the head. On normal anchovy eggs, stages 1 through 5 are easy to distinguish, as also are stages 6 and 7. However, in stages 8 through 11, the free tail portion of the embryo is more difficult to observe in the anchovy egg than in the sardine egg, because the tail develops in a more confined space and is compressed against the body. A portion of the eggs in most samples are exploded or disintegrating and these can be much harder to stage than normal eggs. Staging of these eggs requires extensive experience combined with care.

Aging: The majority of samples contained either 3 or 4 stages of eggs, which represented the 3 or 4 successive days of spawning at that station. At many stations all 8 collections contained the eggs spawned during 3 or 4 days. At the 54 larger stations, 4 series contained 4 days of spawning and 19 series contained 3 days of spawning, in all cases, the maximum number of days anticipated. Only at 11 stations was 1 or more of the days represented by 0 eggs. The 4 days are labelled A, B, C and D. A eggs ranged from newly spawned to eggs 24 hours old (0 hour at 2400 for each day), B eggs were between 24 and 48 hours old, C eggs between 48 and 72 hours old, and D eggs between 72 and 96 hours old. A eggs are undersampled, a phenomenon also encountered with sardine eggs. Assuming B and C day eggs are randomly sampled and that the difference in numbers of B versus C eggs results from mortality, the rate was 35% per day.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Contract to Develop Economic Profile of Commercial Passenger Fishing Vessels (CPFV) Nearing Completion

Gruen, Gruen and Associates have completed the draft of a final report on the contract with NMFS to develop an economic profile of CPFV's and live-bait fishing vessels. During 1977, the year covered by the study, a total of 307 vessels reported engaging in commercial activity. Mail surveys were delivered to all registered operator/owners in two stages, the second covering only the non-respondents from the first stage. A total of 94 completed and usable survey forms were returned. The geographical distribution, and size distribution of active vessels and of vessels completing survey forms are as follows:

GEOGRAPHICAL DISTRIBUTION

	Active Vessels (percent)	Respondents (percent)
San Diego	27	29
San Clemente	10	20
Redondo Malibu	5	3
Santa Barbara	8	10
Santa Cruz	12	6
Half Moon Bay	4	--
S.F. Bay Area	26	22
Bodega Bay	3	7
Ft. Bragg & north	5	4

SIZE DISTRIBUTION OF CPFV'S

Passenger Capacity	Active Vessels (percent)	Respondents (percent)
0 - 10	23	16
11 - 20	16	15
21 - 30	13	15
31 - 45	19	20
46 - 55	12	16
56 - 99	17	16
100+		

The 94-vessel sample has been analyzed by cross-tabulating of vessel charcteristics (age, length, capacity, location, etc.) and a small group of volunteer owners were interviewed in detail about the costs of operating a CPFV. Crew, fuel, ice, bait, insurance, maintenance and other costs are summarized by vessel type. After modifications are made to the report, a final version should be available for distribution in June, according to Dr. D. Huppert, Program Leader.

Analysis of Larval Rockfish Data Continues

John MacGregor, Fishery Biologist, reports that the larval rockfish data show a rather interesting offshore distribution of larvae. For two species, the bocaccio (Sebastes paucispinis) and shortbelly rockfish (S. jordani), the area surveyed was central and southern California; for the coral red rockfish (S. macdonaldi), central Baja California. The time period is several years for the months January, February and March, the period of peak spawning.

In both areas about 60% of all rockfish larvae were taken within 30 n.mi. of land, and about 85% within 60 miles of land. The bocaccio had a more offshore distribution with only 33% of larvae taken within 30 n. mi. of land and 79% within 60 n.mi. of land. The shortbelly rockfish showed a more inshore distribution with 86% of the larvae taken within 30 n.mi. of land and 99-1/2% within 60 n.mi. of land. For the coral red rockfish the percentages were 47 and 91%, respectively.

For the bocaccio there appears to be a trend to more offshore spawning as the season progresses as follows:

N.Mi. from land	Percent Spawning		
	January	February	March
1 - 50	83	62	43
51 - 100	11	28	43
101 - 150	5	8	10
over 151	1	2	4
	100	100	100

No such trend is apparent for the other two species.

Fishery Fact-Finding Trip to Ensenada

Alec MacCall, Marine Biologist with the CF&G, and Economist Jane McMillan traveled to Ensenada, Baja California this month to talk with government and industry representatives about various aspects of Mexican fisheries in Baja California, including the fishing fleet, processing, markets and future develoments for fisheries in Baja California. Over 70 species of fish are landed in Baja California, with tuna, anchovies and sardines the major species both in terms of volume and value. The sardine-anchovy fleet consists of 45 vessels which fish primarily for anchovies on the Pacific coast during the May to November period and for sardines in the Sea of Cortez the rest of the year. Most of the processing is as canned fish or fish meal. All persons contacted agreed that there was a large and expanding market for canned fish, both in Mexico and for export. Overall there was a very optimistic attitude about the future of fisheries in Baja California and expanding markets for their fish.

ALBACORE FISHERIES

Meeting Held to Discuss Use of Satellite Imagery to Assist Fishermen in Locating Oceanographic Fronts

Dr. M. Laurs, Ken Bliss, and David McConaghy attended a meeting on April 3 at the National Environmental Satellite Service (NESS) office in Redwood City, California concerning the program developed by NESS and the Sea Grant Advisory Program several years ago to distribute satellite imagery to assist fishermen in locating ocean temperature fronts where concentrations of fish may be potentially found. Participants at the meeting included representatives from the fishing industry, NWS, NESS, Scripps Institution of Oceanography, NASA, Jet Propulsion Lab, the Sea Grant Marine Advisory Program, and National Marine Fisheries Service. The major areas of discussion were: improvement of the distribution system for the satellite information, obtaining ground truth observations to verify the accuracy of the satellite images, and improved satellite technology in the future.

In 1979, California satellite information will continue to be distributed through Sea Grant marine advisors to key port locations, by facsimile machine and by xerox telecopier from Redwood City. The use of satellite communication techniques for offshore fleets and television broadcasts for inshore fishermen will be investigated during the upcoming year. The collection of ground truth information is continuing. Scientists at Scripps Institution of Oceanography and at the National Marine Fisheries Service are comparing satellite temperature front information with oceanographic observations made by research vessels, airplane overflights, fishing vessels and ships. Analysis of this ground truth information is essential to verify the accuracy and reliability of the satellite information.

* * * * * * * * * *

Lt. David McConaghy, NOAA Corps Officer detailed to the La Jolla Laboratory working with thermal infrared digital data collected by NOAA Polar Orbiting Satellites, has developed an equation which accounts for corrections due to atmospheric attenuation. The coefficients of the equation are determined by using regression techniques and comparing satellite observations to sea surface temperature measurements. The standard deviation of error for satellite measurements using this approach is generally around 0.5° C. McConaghy gave a presentation describing this approach at the April 3, 1979 NESS meeting in Redwood City.

Data Processed on Catch Per Unit of Effort for 1978 Albacore Fishing Season

Processing of catch-per-unit effort data by time area strata for the 1978 albaore fishing season was completed during March. Logbook catch and effort data collected by fishermen during the fishing season were edited and

keypunched by the California Department of Fish and Game, Oregon Department of Fish and Wildlife, and Washington Department of Fisheries. This information was received in La Jolla in the latter part of March 1979 and processed during April by Anthony P. Majors, Fishery Biologist in the Albacore Fisheries Program.

As predicted by Dr. R.M. Laurs before the season, most of the fishing was centered south of San Francisco. The 1978 nominal CPUE was 86.7 fish per day, an improvement over the 1977 CPUE of 59.9 fish per day. The preliminary estimate of total landings of the West Coast albacore fishery in 1978 is approximately 37 million pounds. Total landings for 1977 were 25.5 million pounds.

The following chart gives monthly nominal CPUE for the albacore fishing season 1978 by areas.

	AREA				
Month	South of 34°N	34-38°N	38-42°N	42-48°N	North of 48°N
June	18.02	208.04	0	0	0
July	57.53	102.00	104.00	131.20	0
August	79.33	118.81	108.36	83.39	8.00
Sept.	21.66	90.97	73.83	98.14	62.91
Oct.	8.73	35.72	4.41	44.69	0
Nov.	7.45	3.00	0	0	0
Nominal CPUE for Area	53.59	96.95	100.19	96.12	49.25

Succesful Field Test of Free-Fall Particle Counter Conducted

Dr. R. Lasker, Leader of the Coastal Fisheries Resources Division reported that field tests of the free-fall particle counter conducted from the NOAA research vessel David Starr Jordan were very successful. In approximately 5 minutes time at each cast 0.2 m vertical spatial resolution of particles was obtained down to 80 m. Particles ranging in size from 20 m to 100 m were counted in the water column. Casts were made across the Southern California Bight and coherent layers of particles were seen at adjacent stations. Conversion of taped particle data to make it compatible with the Hewlett-Packard 9825 mini-computer for detailed profiling was undertaken by Joe Caruso, Ken Bliss and Jack Brown. This work should be completed next month.

La Jolla Laboratory Scientists Lecture at University of Washington's College of Fisheries

Drs. P. Smith, J. Hunter and R. Lasker of the Coastal Fisheries Resources Division gave a series of lectures at the College of Fisheries, University of Washington, sponsored by Sea Grant.

Dr. Smith discussed:
1) importance of larval fish research and problems in ichthyoplankton sampling and biomass estimation,
2) patchiness and larval biology, and
3) what is known regarding larval mortality in the sea.

Dr. Hunter presented talks on:
1) reproduction of adults, feeding and swimming behavior of larval fishes,
2) growth, metabolism, ration and foods of larval fishes, and
3) predators of larval fishes.

Dr. Lasker spoke on:
1) factors affecting recruitment of fishes.

In May, Dr. G. Moser will complete this series with Dr. Kendall of the NWAFC. They will discuss:

Dr. Moser:
1) ecology and systematics of larval fishes, and

Dr. Kendall:
1) early life history of northern fishes in relation to fisheries.

According to Dr. Ole Mathisen of the College of Fisheries, and host for this annual series, all of these lectures were enthusiastically received and were of great value to their students and scientists. An University of Washington Sea Grant printed report will be published with an edited version of these lectures.

LARVAL FISHES, COASTAL EAST PACIFIC

Techniques for Detecting Starvation in Fish Larvae to be Applied in Striped Bass Study

Gail Theilacker presented a paper, "Effect of feeding history and egg size on the morphology of jack mackerel, Trachurus symmetricus, larvae," at the symposium on The Early Life History of Fish in Woods Hold, Massachusetts, April 2-5. After the Woods Hole meeting, she presented a seminar, "Effects of starvation on morphological and histological characteristics of fish larvae," at the Virginia Institute of Marine Sciences (VIMS) in Gloucester Point, Virginia. Theilacker later discussed her techniques for detecting starvation in fish larvae with scientists at VIMS and at the Chesapeake Biological Laboratory (CBL) in Maryland. Scientists at VIMS and CBL are proposing to study starvation-induced mortality in striped bass and propose to incorporate Theilacker's methods in their study.

Late Larval Anchovy Sampled for Growth Rate Analysis

During the August 1978 CalCOFI cruise on the NOAA research vessel, David Starr Jordan, a 6' Isaacs-Kidd midwater trawl was used to sample late larval northern anchovy for growth rate analysis. A large proportion of the 40 samples contained anchovy larvae. Abundance was greatest off Malibu and lowest off San Diego County. Insufficient offshore samples were collected to delimit their distribution. Lengths ranged from 10 to 50 mm; most were under 30 mm.

Region	Positive/total samples	Number per pos. sample	Surface temperature
Pt. Vicente	1/5	2	20°
Malibu	4/5	209	20°
Santa Barbara	6/6	182	15-18°
Offshore Sta. 67.70	1/3	1	16°
San Luis Obispo	3/5	2	12°
Channel Islands	7/8	115	16-20°
San Diego	0/6	0	21°

To date, 143 fish from Malibu and Santa Barbara have been aged. Ranges of size at age are the following: 20 days, 12-16 mm; 50 days, 20-27 mm; 140 days, 47 mm. For comparison, in the laboratory at 18°, larvae of age 20 days are 16.5 mm and at 50 days are 34 mm. Complete examination of these fish will include measurement of the size of the outer daily growth increments to test for differences in growth rate between fish from different samples.

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Prediction of Leaping as Energy Sparing Behavior in Dolphins Moving at High Speeds Verified

During April Dr. D. Weihs, NOAA post-doctoral fellow at the La Jolla Laboratory completed a first draft of a joint paper with Dr. David Au, entitled "Dolphin leaping - an energy-sparing behavior at high speeds" which shows that most dolphin species can save energy by "running" and leaping forward out of the water, when forced to move at speeds above 10 knots. This was demonstrated by means of a hydrodynamic model, which compared energy required for swimming underwater close to the surface with that for jumping at the same speed. These predictions were verified by observations during a cruise on David Starr Jordan cruise during January-February 1979.

Dr. Weihs also completed work on a model describing prey ingestion by suction-feeding fish (see Monthly Report, February 1979) and is writing a first draft.

Oceanic Fisheries Resources Division

TUNA RESOURCES PROGRAM

Southwest Fisheries Center will Host 30th Tuna Conference

Dr. Gary T. Sakagawa, Chief of the Oceanic Fisheries Resources Division at the Southwest Fisheries Center, La Jolla Laboratory and Chairperson for the 30th Tuna Conference, announced that the response to this year's Conference has been exceptional. More than 65 participants have registered thus far to attend the Conference which will focus on "Unit stock management of highly migratory species--Is it an imperative?" The Tuna Conference was first organized in 1949 as an informal meeting, or forum, for exchange of scientific information and ideas on tunas and is hosted on a rotating basis by the California Department of Fish and Game, Inter-American Tropical Tuna Commission (IATTC), and the SWFC. This year it will be held May 13-16 at the University of California Regional Conference Center, Lake Arrowhead, California.

The Conference is organized around three sessions. Session I consists of presentations of papers on "Stock Identification Techniques," including the use of tagging, biochemistry, parasites, and X-ray spectrometry in identifying highly migratory stocks. Session II will cover the "Status and Potential Yield from Tuna Stocks" with assessments of sailfish, marlin, bluefin tuna and tropical tunas. Session III will consist of panelists discussing "Management and the Unit Stock Concept," including Dr. James Joseph, IATTC Director of Investigation; Harold F. Cary, General Manager, U.S. Tuna Foundation; John D. Negroponte, Ambassador and Deputy Assistant Secretary for Ocean and Fisheries Affairs, U.S. State Department; and Frank Alverson of Living Marine Resources, San Diego.

Draft Billfish Management Plan Completed

The Billfish Fisheries Management Plan (FMP) Development Team met with the Pacific Fishery Council's Advisory Panel early in April and discussed a first draft FMP proposal on billfish management. The draft was reviewed and revised, sent to the printers and is being released to the public in April. The document (Part I Billfish) reviews the billfish fishery along the Pacific coast Fishery Conservation Zone (FCZ) for swordfish and striped marlin. Part II, which will be released at a later date, is the FMP for oceanic sharks taken within the Pacific Coast FCZ. The Pacific Council's Billfish and Oceanic Shark FMP will be integrated with a plan now under development by the Western Pacific Council to produce a joint management plan for the Pacific.

1978 Billfish Angler Report Released

The 1978 annual report giving the results of the Cooperative Marine Game Fish Tagging Program for billfish and the 1977 Pacific Billfish Angler Survey,

was mailed to more than 2,000 anglers. Angler survey forms for 1978 catches were included. These forms are also being distributed to all big-game fishing clubs throughout the Pacific by the International Game Fish Association.

Tuna Vessel Participation in FAX Advisory Program

During March 1979, 25 tuna seiners and 2 research vessels contributed synoptic weather data to the NMFS FAX Advisory Program. A total of 334 weather and 11 XBT observations were reported via NMFS-licensed radio station WWD. The table below lists data pertaining to program participation during March 1978 and 1979. Numbers of total observations and boats reporting are higher than in March 1978.

	March	
	1978	1979
Number of vessels with equipment	54	48
Number of vessels reporting	23	27
Number of weather obsevations reported	208	334
Number of XBT observations reported	21	11
Total Observations	229	345

Leading all program participants in April is Captain John Gomes and the crew of the tuna seiner, Santa Rosa, with 43 weather observations. NMFS thanks Captain Gomes and crew and all other contributors to this program.

MARINE MAMMAL ASSESSMENT AND MONITORING PROGRAM

1979 Porpoise Population Surveys Completed

Two large-scale surveys are being conducted in 1979 to assess the population of dolphins involved in the tropical tuna fishery of the eastern tropical Pacific. One survey involves a PBY aircraft to conduct 20-24 transects over an area from central Mexico to Peru. Preliminary results from this survey will be reported next month.

The other survey involved the NOAA research vessels, David Starr Jordan and Townsend Cromwell, which simultaneously surveyed an area off Central America. Cruise leader for this survey was Dr. David Au, Fishery Biologist at the La Jolla Laboratory. He reports that the equatorial distribution of common and striped dolphins was much curtailed in comparison to previous years which were much warmer. A detailed temperature and surface drift study was conducted along the equator to be compared with a similar section in the western Pacific obtained by NORPAX scientists at SIO. Off Central America the two survey vessels, David Starr Jordan and Townsend Cromwell, followed paralled courses to survey simultaneously an area also covered by the aircraft. Nearly twice as many porpoise schools were sighted from the Jordan in comparison to the Cromwell, although both ships reported the same number of

spotted/spinner dolphin schools. Many more small schools (<50 individuals), especially pilot whales and Grampus, were seen from the Jordan.

Estimated Kill Rate of Dolphins Decreases Slightly in 1979

Dr. Nancy Lo, Statistician, and Bruce Wahlen, Mathematician, reported that the kill rate of dolphins killed incidentally to tuna purse seining through April 15 was 2.52 porpoise per set, a rate similar to that for the same period in 1978. The estimated rate had been decreasing slightly as the season progresses. There were more sets on porpoise during the same period this year--713 sets as compared to 671 in 1978.

MARINE MAMMAL BIOLOGY & TECHNOLOGY

Plans Progress for Tracking Dolphins by Satellite

NASA has tentatively agreed to allow use of the NIMBUS-6 satellite for tracking dolphins in the eastern tropical Pacific according to Jackie Jennings, Fishery Biologist in charge of the program. NIMBUS-6 originally was to have terminated operations but will remain active at least through FY80. Previous to this agreement, the SWFC was planning to use the more expensive French-U.S. Argos System (TIROS-N) for the dolphin-tracking experiments.

The transmitter package for the experiment has successfully undergone bench tests and tests on a captive dolphin in Hawaii, both tests conducted with NIMBUS-6. Short-term tests on wild Hawaiian spotted dolphins, Stenella attenuata, are scheduled to begin May 21 and will be carried out by Jennings, Raymond Stives, Biological Technician, and personnel from the National Fisheries Engineering Laboratory in Bay St. Louis, Mississippi, using a vessel chartered from the Manta Corporation, Honolulu. If the Hawaii trials are successful, a contract will be let in June for manufacture of 20-30 transmitter units, and a full-blown experiment will be carried out on the "porpoise-fishing" grounds in the eastern tropical Pacific. Several research questions important to stock assessment and management will be addressed by the experiment. Among these are the question of the nature, scope, and integrity of schools and larger-scale aggregations and the questions of discreteness and movements of putative stock units. The transmitters will vary in reporting frequency and (inversely correlated) in lifespan to a maximum of about one year. Maximum transmitting frequency will be daily.

Dolphin Aging Experiment to be Carried Out at Hubbs-Sea World Research Institute

Studies of vital rates and structure of dolphin populations require the ability to determine ages of individual animals. This has been done largely by examination of growth layers in teeth. There have been two major questions in the growth-layer analysis: what should be counted, and what do the units counted (now called "growth layer groups" or GLG's) represent in absolute

time, i.e., the problem of calibration. A major conclusion of the recent (September 1978 at SWFC) Workshop on Determining Age of Odontocete Cetaceans was that in vivo marking of hard tissues with tetracycline holds the most promise both for defining GLG's and for their calibration. To this end, 351 spotted dolphins, Stenella attenuata, were tagged, injected with tetracycline and released during Cruise IV of the Dedicated Vessel Program last fall. Return of specimens from injected animals will yield data on growth rates of hard tissues.

In addition to this field experiment, a contract has been let to Hubbs-Sea World Research Institute (HSRI) for the first year of a planned 3-year study of growth rates of hard tissues of dolphins in captivity. The basic experiment will consist of intramuscular injections of at least 12 bottlenose dolphins, Tursiops truncatus, representing a range of age-sex categories followed by extraction of teeth at regular intervals. Attempts will also be made to include at least one each of Pacific whitesided dolphin, Lagenorhynchus obliquidens; common dolphin, Delphinus delphis; and short-finned pilot whale, Globicephala macrorhynchus. The animals will be kept in San Diego and at the HSRI facility in Orlando, Florida. The experimental design includes variation in diet. Results of the project will be analysed by Albert C. Myrick, Jr., Wildlife Biologist at the La Jolla Laboratory and scientists V.S. Gurevich, L.H. Cornell, and E.D. Asper at HSRI.

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Groundfish Management Plan Improved

The Groundfish Management Plan has been considerably improved by some recent changes. This is the opinion of Dr. William H. Lenarz, leader of the Rockfish Analysis Task at the Tiburon Laboratory, following his participation as a member of the Groundfish Management Plan Development Team at a Team Meeting in Portland early this month. These changes, and others anticipated, are the result of discussion among Team members, the Team's Advisory Panel, the Scientific and Statistical Committee, and participants in the fishery. The plan development process has considerably improved knowledge of the fishery. In some cases, statistics have been improved by necessity; in other cases, aspects of the complex multispecies nature of the fishery have been clarified. Options have been developed for having either 17 management units, grouped OY (optimun yield) concept, or 38 management units, multiple OY concept. The tradeoffs involve minimization of risks of overfishing individual stocks versus the costs to management and fishing interests of having a very complex management system. The present draft of the plan treats OY as a quota, even though there is little or no evidence that some of the stocks need the protection of a quota system, because original interpretation of the law indicated that such a system is required. Since then, other interpretations of the law indicate that a quota system is not required if the management regime insures no overfishing. Development of new options under the new interpretation is in progress. The Team will meet in Seattle, May 14-18, 1979 and another meeting will be held at the Tiburon Laboratory, May 29-31, 1979, by the Team, members of the Scientific and Statistical Committee, and scientists involved in development of the New England Groundfish Management Plan, to discuss aspects of the two plans.

Absence of Junvenile Blue Rockfish Inshore During Spring May Be Annual Event

As was true last year at this time, juvenile blue rockfish, Sebastes mystinus, (less than about 100 ml long) were essentially absent at the Mendocino nearshore study sites this month, according to findings by Dr. Edmund S. Hobson, Leader of the Fish Communities Task, and Fishery Biologist Tony Chess. These small fish are prominent here following their initial arrival during early summer, and remain so until late winter or early spring. Larger individuals (more than about 150 mm long) continue to be present, but in lesser numbers than at other times of the year. As blue rockfish of different sizes feed on different components of the plankton, their observed patterns of occurrence are being related to seasonal patterns in the composition of nearshore plankton.

Investigation Leader Presents Major Address at Tester Symposium

Dr. Edmund S. Hobson, Investigation Leader, presented the major address at the Albert L. Tester Memorial Symposium, held in April at the University of Hawaii. In his lecture, Dr. Hobson compared communities of shore fishes in tropical and temperate seas.

FISHERIES DEVELOPMENT INVESTIGATION

Fishing for Shortbelly Rockfish to Begin Soon

Plans for an upcoming experimental fishing trip to catch shortbelly rockfish have been finalized. Shortbelly rockfish are one of the most abundant species in California waters, but not presently utilized owing primarily to its small size. Sus Kato, Leader of the Underutilized Fishery Resouces Develoment Task at the Tiburon Laboratory, reported that three potential users have ordered 5,000 pounds each for experimental processing and sale. In addition, a thousand pounds of headed and gutted shortbelly rockfish will be air-shipped to a surimi (minced fish) processing plant in Alabama, where a group of technicians from Japan will evaluate the product. A small sample will also be shipped to the National Marine Fisheries Service Northeast Center, to be run through their recently developed machine which heads, guts, and cleans the body cavity of fish. Fishing will be conducted near San Francisco aboard two commercial fishing vessels from Fort Bragg, using the Laboratory's newly-built Polish rope pair trawl, with a mouth opening of about 65 feet by 125. A second net, a conventional single-boat midwater trawl, has been loaned to a fisherman who will attempt to catch shortbelly rockfish in southern California. Data on catch rates will permit comparison of relative efficiency of the two methods.

Live Sharks Sought for Study of Aging Techniques

Fishery Biologist Susan Smith at the Tiburon Laboratory attempted to obtain live specimens for her shark age verification study this month. Gill net fishing at night produced the best catches of sharks, although mortalities occurred if the net was left in the water for an extended period of time (overnight). Smith will be experimenting with the UV-fluorescing compound oxytetracycline hydrochloride (OTC) to determine the minimum dose required to make a well-defined "time" mark in the vertebral centra. The centra are the structures most often used in aging elasmobranchii.

Two Triakis semifasciata, three Mustelus henlei, and one Squalus acanthias were captured, tagged, and injected with varying doses of OTC from 15 mg/kg of body weight to 50 mg/kg. One Mustelus died a few days following injection, presumably because of capture stress and not from the injection. The sharks will be maintained in a 5,000-gallon holding tank and then later sacrificed to determine the degree of OTC deposition in the vertebrae and

uptake in the liver. This summer, elasmobranchii (primarily Triakis) will be tagged, injected, and released in the field.

Gill Disease at Hatchery May Delay Delivery of Imprinted Fish

Roger Green, Leader of the Recreational Fisheries Improvement Subtask at the Tiburon Laboratory, reports that Daniel Ralph, Fishery Biologist, traveled to the Feather River Hatchery to service the Laboratory's chemical imprinting system. While there he learned that there had been an outbreak of bacterial gill disease and that 75,000 fish being imprinted for Tiburon were killed and replaced with fish of equal size. Because the fish were so young, it is believed that there is sufficient time to imprint properly the replacement fish before their delivery to Tiburon Laboratory this summer.

Green also reports that routine maintenance and preparations for the new arrangement of floating net pens to be used this summer are being completed.

PHYSIOLOGY INVESTIGATION

Studies Continue on Effects of Chronic Pollution On Striped Bass

With funding allotted from the Marine Sanctuaries Act 202, the staff of the Physiological Ecology Program at the Tiburon Laboratory, has been able to continue studies on the effects of chronic pollution on striped bass. The spring spawning migration has begun, and Dr. Jeannette A. Whipple and Brian Jarvis are making collections of striped bass from different areas of the spawning run with the cooperation of the California Department of Fish and Game Anadromous Fish Branch staff. Histopathological autopsies are being done and subsamples taken for analyses of pollutant concentrations in tissues.

Additional temporary staff are being hired to assist in the sampling, sample analyses, and to assist in laboratory experiments on the effects of selected pollutants on striped bass spawning adults, eggs and larvae.

A contract is being negotiated with San Francisco State University for the performance of laboratory experiments studying the uptake, accumulation, retention, and translocation of selected pollutants also found in tissues of field-collected striped bass during their spawning migration. Effects of chronic exposures on several physiological parameters relating to reproduction, growth, and survival will be determined.

Experiments on the effects of the variables of food, pollutants, and ions on striped bass eggs and larvae have been planned by Whipple and Maxwell B. Eldridge, and preparations have been made to conduct these experiments as soon as fish spawn at the California Department of Fish and Game Elk Grove Hatchery.

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS

Agreement Reached on Priorities for Fishery Information System

The Southwest Fisheries Center and Southwest Region (SWR) submitted a joint contract proposal to NMFS, Washington in October 1978 to design and implement Phase I of the Fishery Information System (FIS). The FIS is an improved fishery data, statistics and information system for the NMFS Southwest Region, including California, Hawaii, Guam and American Samoa. NMFS has approved $125,000 for the contract proposal.

On April 11, a joint SWFC and SWR planning meeting was held at the La Jolla Laboratory and agreement was reached on FIS priorities as follows: 1) strengthening the Hawaii Fish and Game's fishery statistics system; 2) supporting the California Department of Fish and Game in system design and implementation to upgrade (speed-up) fishery landing and logbook statistics collection and computer input; and 3) maintenance of coordination with similar Northwest Region statistics work with Oregon and Washington. These items are closely followed in priority by a fourth component of the FIS--the design and establishement of an overall framework and cooperative agreement for "port-sampling."

Fred Kellenberger and Robert Skillman, Honolulu Laboratory, will be working on the planning and issuing of cooperative FIS development contracts with the states.

Implementation of PACES (Pacific Area Cooperative Enforcement System) Continues

Fred Kellenberger, Data Systems Manager for the Center, reports that work is continuing on implementation of PACES. The PACES operations manual and internal documentation have been completed. A meeting was held on April 5 at Long Beach with Southwest Region, Center and Potomac Research Incorporated (PRI) personnel to discuss data entry. It was decided that some of the data would be sent out to a local keypunch vendor to expedite data entry.

Development of Software Programs for ORION System Continues

The development of software programs for the NOAA research vessel Jordan's ORION (Oceanographic Research Interactive Onboard Network) system continued in April, according to Fred Kellenberger. Meetings were held between potential system users, Potomac Research, Incorporated (contractors for system development) and ADP personnel at the Center in order to analyze draft program specifications for the ORION system.

Definition of CalCOFI and shipboard housekeeping requirements are 90% completed. More emphasis is now being placed on defining the requirements of the many and varied oceanographic uses for the system. Interface of the ORION

system with the Albacore Fisheries program's HP 9825/CTD system was found to be feasible. With the aid of the Pacific Marine Center in Seattle, interfacing of the flowmeter equipment to the ORION system is being investigated.

CalCOFI Data Management System - Effort Concentrated on Providing Data for Estimating Anchovy Biomass

Dorothy Roll, Computer Systems Analyst, and Rich Charter, CalCOFI Data Manager at the La Jolla Laboratory, reported this month that a major effort was made to provide data for estimating anchovy biomass. Because few stations were occupied in the area west of Mexico, the region codes have been redefined for the 1979 biomass analysis. Oden Burris, Computer Programmer, has recoded the Region Pooling program and will generate the required tables of selected station data for 1951 through 1979. The tables will consist of summary data for the northern area and southern area of the central subpopulation of anchovy. Plans are to submit these reports to Dr. Gary Stauffer for analysis by May 31.

During April, progress also continued on the rewriting of the PRETOW prescreening program in standard ANSI FORTRAN IV for the CalCOFI net tow data. In place of the original PRETOW program, two programs have now been designed--one to pre-edit the data and a second to produce the "Plankton Volume Record and Sorter Sign-Out Sheet." During April, the second program was completed, tested, and delivered to the user. Also, during April a seventh subroutine was written and compiled to be added to the six produced during March for the support of PRETOW.

Progress Continues on Data Management Projects

In other developments in the ADP program, Computer Systems Analyst Dorothy Roll is conducting a feasibility study for computerizing time cards at the La Jolla Laboratory. She is preparing a report based on interviews with Valerie Spowart, Timekeeper, which will define the current manual method. During May, Roll will review the feasibility of using the NBI Word Processor for preparing time cards.

Robert Butler, Computer Programmer, has implemented a subset of the Southwest Region Market News Data Management System, which contains the Puerto Rico, American Samoa and Hawaii (PRAMSH) tuna cannery receipt data. A preliminary draft of the User's guide for PRAMSH has been forwarded to James Bybee at the Southwest Region to assist his staff in entering data into PRAMSH and in generating the monthly report for the widely circulated Market Newsletter.

Butler is also working on the data verification software for the Popoise Data Management System. All program codes for the 1979 Porpoise Observer Data Sets have been accepted by the Oceanic Fisheries Resources Division and the programs are in production run for processing current data. The first of the series of internal and external documentation for the 1979 Porpoise Data Edit software package has been submitted to the scientists in the Marine Mammal

program for review. This first set contains 4 of the 14 COMMON subroutines used in the data verification system.

During April a number of meetings have been held between the Pacific Marine Fisheries Commission (PMFC) and the Center to discuss implementation of the Coast Wide Data System (CWDS). A contract has been issued to Potomac Research Incorporated (PRI) for the establishment of the CWDS. PRI will merge 1974, 1975 and 1976 data tapes from Washington, Oregon, and California and develop a CWDS Data Base Management System for retrieval of information.

Dorothy Roll, Rich Charter, Jack Brown, Electronics Specialist, and Nick Iorio, Computer Specialist, have reviewed the capabilities of graphic plotters and selected the 4662 Interactive Digital Plotter by Tekronix. Reasons for selection were that the Tektronix has the routines to interface with the Burroughs computer and the INFONET system; costs less and has multimedia pen capability.

The Southwest Fisheries Center, Southwest Region, Southeast Fisheries Center and Northeast Fisheries Center were all successfuly using separate (but equal) Financial Reporting Systems (FRS) in April. The FRS gives financial manager and task leaders essential financial information on the status of the various task plan budgets. The Southeast Region, originally scheduled to implement the FRS on the INFONET system, has elected to delay until the conversion of the FRS to the southeast computer system.

A contract has been issued to Potomac Research, Incorporated in April to develop the Southwest ADP Requirements Study. The study is required by NOAA, the Department of Commerce and the General Services Administration for the approval of any new computer equipment and the development of new computer systems. The requirements study will recommend how the Center and the Region should operate for the next five years in the area of data processing. Cindie Tashima, senior systems analyst, has been assigned by PRI to develop the requirements study. Tashima will be meeting with the various users and data management personnel to determine data requirements.

MISCELLANEOUS

HONORS AND AWARDS

Senior Scientist Completes 40 Years of Government Service

On April 16, Dr. Elbert Ahlstrom received a 40-year pin from James Walsh, Deputy Administrator of NOAA, at a general staff meeting at the Southwest Fisheries Center (see photo). The occasion was a milestone for Dr. Ahlstrom as well as for the Center whose history has been closely identified with Dr. Ahlstrom's distinguished career in the federal government.

In the spring of 1939, a 29-year old Ph.D., Elbert Ahlstrom began work with the U.S. Fish and Wildlife Service as a Junior Biological Aid. His first work assignment was to sample commercial landings of California sardines at Grays Harbor, Washington, and Monterey, California, taking sardine scales and ear bones for determination of the age of the fish.

As the years passed, Dr. Ahlstrom's talents and abilities were recognized with continuing and progressive responsibility. He was in charge of work at sea on sardine egg and larva studies, carried out cooperatively with the University of California's Scripps Institution of Oceanography on their old sailing research vessel, the E. W. Scripps in 1940 and 1941, and later as part of what would become the California Cooperative Oceanic Fisheries Investigations (CalCOFI). CalCOFI was organized in 1947 as a cooperative research effort among state agencies and the Federal Government to conduct an inquiry into the causes for the catastrophic decline in the landings of the Pacific sardine, which at one time supported the largest commercial fishery in the U.S.

In time, Dr. Ahlstrom progressed to project leader in charge of the quantitative collection at sea of plankton organisms, and in 1959 became Director of the Biological Laboratory at La Jolla, California. In 1967, Dr. Ahlstrom served as the Administrator of the Fishery-Oceanography Center from which he was promoted that same year to his present position as Senior Scientist at the National Marine Fisheries Service, Southwest Fisheries Center, La Jolla, California.

Dr. Ahlstrom's major scientific contribution has been the role he has played in developing a scientific technology for stock assessment of marine fishes by means of systematic surveys of the eggs and larvae of such fishes in the plankton. Through his innovative and creative leadership, methods for sampling, identifying, and analyzing the patterns of abundance and distribution of larval pelagic fishes have been developed into a precise science.

It was Dr. Ahlstrom, working on his own, who methodically evolved the systematics for identifying the eggs and larvae of fishes taken in the plankton hauls. Utilizing the so-called "dynamic approach" in describing the early life history stages of marine fishes, he worked backwards from adults and juveniles to late-stage larvae, and then progressively backwards to early-stage larvae, yolk-sac larvae, and finally the egg stage.

Dr. Ahlstrom's standing in the scientific community has been recognized with an appointment as Adjunct Professor of Oceanography at the University of California, San Diego. His scientific papers, which now number more than 75, are widely read and quoted. In 1972, he (with co-author H. Geoffrey Moser) received the award of the Wildlife Society for the outstanding fishery publication of 1971 for their classic monograph on the development of lanternfishes in the California Current.

In 1965, Dr. Ahlstrom received the highest award of the U.S. Department of the Interior, its Distinguished Service Award, in recognition of more than 25 years of outstanding service in fisheries research and oceanography; in 1973, he was the recipient of the U.S. Department of Commerce Gold Medal, the Department's highest honor, for contributions of major significance to the Department and the Nation.

James P. (Bud) Walsh, Deputy Administrator of NOAA, congratulates Dr. Elbert Ahlstrom on completion of 40 years of Federal Service and presents him with a diamond-studded pin during his recent visit to the Southwest Fisheries Center at La Jolla.

Honolulu Laboratory

Thomas Hida, Fishery Biologist, and Tamotsu Nakata, Scientific Illustrator, were presented 30-year service pins by Director Richard Shomura at a general staff meeting held in the Seminar Room on April 10, 1979.

PUBLIC AFFAIRS

April 2 - Dr. Edmund S. Hobson, Tiburon Laboratory, presented a seminar at the University of Hawaii on Fish Communities in the Hawaiian Archipelago.

9 - Center Director Barrett was a judge in the Biology Section of the 1979 Greater San Diego's Science Fair in San Diego. This is the 25th anniversary of the Science Fair here.

- Howard Uchida served as Associate Judge at the 22nd Science and Engineering Fair State Finals in Honolulu.

19 - As has been the custom since 1964, the Center again was host to student participants in the Greater San Diego Science and Engineering Fair. This year, Dr. M. Laurs welcomed a group of 25 young people. He gave a brief overview of the research underway at the La Jolla Laboratory and later took the students on tours, with accompanying lectures, on research activities in the larval fish laboratory, the experimental aquarium and the environmental data acquisition area.

20 - Dr. Edmund S. Hobson presented a talk at the Tiburon Laboratory on Fish Communities in California Coastal Fishes to students from the College of Marin.

26 - R. Lynn, Oceanographer, discussed careers in oceanography and related earth sciences with high school students during a Career Seminar Day at Torrey Pines High School. Serving with Lynn on the science panel were three representatives from science in industry. Because of the widespread interest of students in science, two sessions of the science-career presentation were held. In all, about 90 students attended. Active question and answer period followed the presentations.

SEMINARS

La Jolla Laboratory

April 5 - Vincent Zegowitz and Robert Dennis, Environmental Data and Information Service, discussed, "Ocean data inventory for the global weather experiment."

10 - Gerald Kuhn, Research Associate, Geological Research Division, Scripps Institution of Oceanography presented a talk, "New thoughts on the coastal erosion of northern San Diego County." Mr. Kuhn illustrated his presentation with a series of before and after photographs.

17 - Dr. Douglas Eggers, College of Fisheries, University of Washington, discussed, "Limnetic feeding behavior of Lake Washington juvenile sockeye salmon and predator avoidance."

26 - Andrew Bakun, Physical Oceanographer at the Center's Pacific Environmental Group in Monterey, California gave a lecture entitled, "Oceanographic parameters of larval fish transport in the California Current system."

Tiburon Laboratory

April 27 - The second joint seminar with San Francisco State University was held at the Tiburon Laboratory. The seminar was presented by Joseph W. Maresca, Jr., Physical Oceanographer, Remote Measurements Laboratory, Stanford Research Institute International, and entitled: "HF Sky Wave Radar Measurements of Tidal Currents in San Francisco Bay."

TRAINING

April 2-3 - Michael J. Bowers, Biological Technician, and Pete Benville, Research Chemist, of Tiburon Laboratory attended Advanced Immunology Wet Workshop, Helena Laboratories, San Francisco, California.

5-6 - Hazel Nishimura, Librarian, and Mr. George Liao, Operations Research Analyst, attended a DIALOG System Seminar at the Hawaiian Telephone Company in Honolulu.

12 - Nishimura also attended a 4-hour Time Management Workshop at Naval Station Pearl Harbor, sponsored by the Office of the Naval Regional Librarian Pacific and the Office of the Staff Librarian, Army Recreation Services Division.

VISITORS

Honolulu Laboratory

March 28 - Fred Martini, President, Marine Environmental Research, Inc. (MER), Cortez, Florida, met with Director Shomura to discuss MER's operations--basic research on the marine environment, education (scholarships and fellowships), and research into tropical diseases in the islands of Oceania--and availability of MER research vessels Varua and Serenity.

- Alan K. Kam, Outgoing Coordinator, Marine Options Program, UH, and Biological Assistant, Hawaii Institute of Marine Biology (HIMB) (turtles) visited Mr. Shomura.

29 - George Balazs, HIMB, met with Shomura to discuss marine turtles, the forthcoming International Turtle Meeting in Washington, D.C. (25-30 November 1979) and the Turtle Workshop in Noumea, New Caledonia (11-14 December 1979).

30 - Bernard Fink of Van Camp Sea Food Company, San Diego, visited the Laboratory for discussions with Messrs. Shomura, Otsu, and other staff members.

April 2 - Dr. Hoyt Wheeland, Director, Office of Information Systems, NMFS, Washington, D.C., met with Shomura, and also spent some time with Dr. Adams.

3 - Dr. E. Shallenberger of Manta Corporation met with Shomura to discuss their contract with the USFWS to conduct a study of management alternatives for Tern Island, French Frigate Shoals.

4 - Messrs. Earl Combs and Jeff Tobolski of Earl Combs Company (ECC) met with Shomura to discuss fishery matters as they related to Hawaii's master plan for fisheries. ECC has a contract to prepare part of the State's master plan.

6 - Genjirou Nishi, Assistant Curator, Marine Science Museum of Tokai University, visited H. Yuen.

13 - Kathryn A. McCarthy, Western Representative, Pergamon Press, Inc., spent several hours with Nishimura discussing services available to libraries from Pergamon Press.

April 18 - Shomura was visited by Sharon Hendrix regarding employment possibilities while she attends graduate school at the UH. Ms. Hendrix is currently working with Dr. John Hunter, La Jolla Laboratory, under a fellowship program.

La Jolla Laboratory

A first-time visitor to the Center on April 16 was James P. "Bud" Walsh, Deputy Administrator of NOAA, who was accompanied by his Special Assistant Judith Roales. Although Walsh was interested in visiting the Center in general, his particular purpose here was to discuss tuna/porpoise matters. Walsh began his visit with a general meeting of the staff where he presented Dr. Elbert Ahlstrom with a 40-year length of service pin and then met with Dr. Gary Sakagawa and members of his senior staff. He ended his stay at the Center with a tour of the facilities and a brief meeting with administrators and staff. Walsh and Roales continued on to Long Beach for a next-day flight to Catalina Island and discussions with Sea Grant directors on the status of their programs.

April 13 - Eileen L. Shea, NOAA's Office of Congressional Affairs.

17 - Dr. Bernd Wursig, University of California, Santa Cruz.

24 - Fred Berry, NMFS Southeast Fisheries Center, Miami, Florida.

30 - Grahame King, Pacific Marine Fisheries Commission, Portland, Oregon.

Pacific Environmental Group

April 6 - Vincent Zegorwitz - EDIS, Washington, D.C.

- Robert Dennis - EDIS, Washington, D.C.

16 - Leon Panetta, Congressman, 16th District, Monterey, CA.

18 - Captain O'Conner, NOAA Admin. Staff, Washington, D.C.

19 - James Walsh, Deputy Administrator, NOAA, Washington,D.C.

- Judith Roales, Assistant to Mr. Walsh, Washington, D.C.

25 - Aaron Bobo, Personnel Office, Terminal Island, CA.

26 - Dr. Preisendorfer, PMEL, NORPAX-Scripps, La Jolla, CA.

Tiburon Laboratory

April 2 - George Fulton, Marine Construction and Design Company, Seattle, WA.

4 - Sam R. Aigh, National Film Board, Tokyo, Japan.

- Darrell Demory, Oregon Department of Fish and Wildlife, Newport, OR.

- Mel Odemar, California Department of Fish and Game, Sacramento, CA.

- Robert N. Smith, Glenoma Trout Farm, Mill Valley, CA.

6 - Rick Wood, Sea Lion, Sausalito, CA.

9 - Richard King, Hanford School District, Hanford, CA.

11 - William A. Anderson, Kennedy Engineers, San Francisco, CA.

- Jim Daugherty, Brelje and Race, Santa Rosa, CA.

- F.M. Kennedy, Kennedy Engineers, San Francisco, CA.

- Ed Nute, Construction Engineer, San Rafael, CA.

- Anthony Wiedemann, Kennedy Engineers, San Francisco,CA.

12 - Leroy Carlenzoli, Brelje and Race, Santa Rosa, CA.

- Morgan J. Griffith, San Francisco State University, San Francisco, CA.

20 - Robert Drewes, California Academy of Science, San Francisco, CA.

- Judith Roales, NOAA, Washington, D.C.

- James P. "Bud" Walsh, NOAA, Washington, D.C.

21 - Mark Tolbert, Forest Knolls, CA.

23 - Kazemi, State Regional Water Quality Control Board, Oakland, CA.

- Thompson, State Regional Water Quality Control Board, Oakland, CA.

- Chris Toole, Ecological Analysts, Inc., Concord, CA.

- J.C. Wang, Ecological Analysts, Inc., Concord, CA.

April 24 - Aaron A. Bobo, Terminal Island, CA.

25 - Lt. Commander Martin R. Mulhern, NOAA Ship McArthur, Seattle, WA.

26 - Gordon Gray, U.C. Berkeley, Berkeley, CA.

- Tom A. Sawtell, Mariculture Northwest, Inc., San Francisco, CA.

27 - Marcia Bradley, San Francisco State University, Tiburon, CA.

- David D. Frydennlund, U.S. Coast Guard, San Francisco, CA.

- Joseph W. Maresca, Jr., Stanford Research Institute International, Menlo Park, CA.

- Steve D. Siglin, U.S. Coast Guard, San Francisco, CA.

MEETINGS AND TRAVEL

Honolulu Laboratory

April 5 - David M. Peters, Executive Assistant to U.S. Senator Daniel K. Inouye, Hawaii, met with Richard Shomura, Director, Honolulu Laboratory, and Doyle Gates, Western Pacific Program Office (WPPO), SWR, regarding fishery-related matters in the central and western Pacific.

- Shomura attended a billfish FMP meeting arranged by the WPRFMC. Other participants included Lawrence D. Six of the Pacific Council, Kitty Simonds of the WPRFMC, James Sutherland of the Hawaiian International Billfish Association, Gates, WPPO, and Honolulu Laboratory staff members, H. Yuen, and Drs. Adams, Mendelssohn, Skillman, and Wetherall.

- Dr. Y. Hokama of the University of Hawaii met with Shomura, Uchida, and Dr. Polovina to discuss ciguatera problems.

12 - Shomura met with (1) HDFG and NMFS personnel to discuss fisheries and socio-economic data, and (2) HDFG, industry, UH, and NMFS personnel to discuss ciguatera problems.

18 - Shomura had a luncheon meeting with John C. Marr, newly appointed Executive Director, WPRFMC.

April 19 - Shomura met with Andrew Gerakas, Chairman/President, Pacific Tuna Development Foundation (PTDF), to discuss PTDF projects for 1979.

20 - Shomura attended a breakfast-meeting at the Federal Building cafeteria, called by the UH Sea Grant Office. In attendance was Congressman Dan Akaka, who is interested in commercial fisheries in connection with his position on the House Subcommittee on Merchant Marine and Fisheries.

23 - Shomura attended a meeting of State, UH, and industry personnel to discuss ciguatera problems in Hawaiian fishes.

La Jolla Laboratory

March 31 - April 6 - Elbert Ahlstrom, Angeles Alvarino, Roger Hewitt, John Hunter, Charles O'Connell, Robert Owen, Geoffrey Moser, Gail Theilacker, Paul Smith, and James Zweifel traveled to Woods Hole to attend an Early Life History of Fish Symposium.

2 - Dr. G. Stauffer attended an Advisory Committee meeting for Commission of the Californias.

2-3 - Michael Laurs, Ken Bliss, and David McConaghy were in Redwood City, California to attend a satellite meeting sponsored by Sea Grant and the National Environmental Satellite Service for sate-lite-oceanography fisheries.

3 - B. Remington traveled to Tiburon to discuss plans for an engineering survey for the discharge at the Tiburon site.

4-6 - Director Barrett in Washington, D.C. to review personnel and budgetary matters.

5 - F. Kellenberger in Long Beach to meet with California Department of Fish and Game and Southwest Region personnel on the Southwest Enforcement system and other data management activities.

11 - Dr. D. Huppert attended the Sea Grant Fisheries Research program meeting in San Francisco.

12 - Drs. Huppert and Stauffer participated in a Panel discussion of anchovy management for the San Diego County Fish and Game Association.

April 16-19 - David Mackett traveled to Baltimore to attend a State/ Federal policy and planning meeting.

17-21 - Dr. G. Sakagawa traveled to Seattle to attend a Department of Commerce Exceptional Management Practice Seminar.

18 - Dr. Stauffer attended the Instituto Nacional de Pesca/ CalCOFI Aging Subcommittee meeting in Long Beach.

April 19 - May 2 - R. Stives was in Honolulu to conduct tests of satellite-linked transmitters on wild Hawaiian spotter dolphins near the Hawaiian Islands.

April 22-23 - Kellenberger in Portland, Oregon to meet with the staff of the Pacific Marine Fisheries Commission on the Coast-Wide Data System contract.

22-29 - Jackie Jennings was in Honolulu to conduct tests of satellite-linked transmitters on wild Hawaiian spotter dolphins near the Hawaiian Islands.

25 - Dr. D. Huppert traveled to San Francisco to meet with Gruen, Gruen & Associates regaeding their final contract report.

25-26 - Dr. P. Smith was in Ensenada to attend working discussions and data exchange with scientists at Centro de Investigacion Cientifica y de Ensenada.

26-28 - Director Barrett traveled to Honolulu to attend a meeting with Gary Smith, Dole Gates and Richard Shomura to discuss setting up a recovery team for monk seals in November 1979.

April 29 - May 3 - David Mackett traveled to St. Petersburg, Florida to attend a NMFS Planners' Workshop.

Pacific Environmental Group

March 28 - April 6 - Dr. Richard Parrish traveled to Woods Hole, Massachusetts to attend the ICCES symposium on the Early Life History of Fish.

March 30 - April 13 - Andrew Bakun traveled to Moscow, USSR to participate in the seminar/workshop on IGOSS Data Processing and Services Systems sponsored by IOC and WMO.

April 9-12 - Dr. Douglas McLain traveled to La Jolla to prepare plans for the annual status of the environment report and XBT summary report.

April 8-13 - Donna Mallicoate traveled to Long Beach, CA to obtain research data from the California Department of Fish and Game.

Tiburon Laboratory

April 2-6 - Dr. Jeannette A. Whipple and Maxwell B. Eldridge traveled to Woods Hole, Massachusetts to attend "The Early Life History of Fish" Symposium.

3 - Norman J. Abramson, Laboratory Director, and Walburga Giguere, Administrative Officer, met with John Hinman, Chief, Administrative Services, NASO; Ken Schmidt, Western Regional Engineer, Seattle; Ben Remington, Executive Officer, SWFC; Dr. Erwin Seibel, Director Tiburon Center for Environmental Studies; Dean Parnell and Morgan Griffith, San Francisco State University, to discuss Regional Water Quality Control Board requirements and plans for an engineering survey for the discharge at the Tiburon site.

3-6 - The Plan Development Team for Dungeness Crab met at Tiburon. Ed Ueber attended.

10 - Dr. William H. Lenarz and Ed Ueber traveled to Morro Bay, California to meet with fishing industry members concerning the Groundfish Management Plan.

10-11 - Sus Kato traveled to Fort Bragg, California to meet with fishermen and a processor regarding an upcoming experimental fishing trip to catch shortbelly rockfish.

11 - Walburga Giguere served with Morgan Griffith, San Francisco State University, and Ken Schmidt, Western Regional Engineer, Seattle, on a Review Board to select a consulting engineering firm.

11-13 - Norman J. Abramson attended a meeting of the Shrimp Management Plan Development Team, Portland, Oregon.

- Ed Ueber traveled to Portland, Oregon to meet with the Scientific and Statistical Committee regarding Dungeness crab, and also chaired the meeting of the Groundfish Planning Team. Dr. William H. Lenarz also attended the Groundfish Planning Team meeting.

12 - Walburga Giguere attended a meeting with Dale Fleming, Director, Administrative Services, San Francisco State University; John Hinman, NASO; Ken Schmidt, NASO; and Morgan Griffith, Plant Engineer, to discuss funding for the proposed engineering survey.

April 17 - Sus Kato met with members of the All Japan Kamaboko Makers Association in Oakland, California. Discussions centered around the feasibility of using California fish, particularly shortbelly rockfish, for Japanese fish cake products.

20 - A general staff meeting was held at the Tiburon Laboratory with the Director, Task Leaders, and Administrative Officer during the visit by James P. "Bud" Walsh, Deputy Administrator of NOAA, and his Assistant, Ms. Judith Roales.

24 - Aaron Bobo, Area Personnel Office, SWFC and SWR, met with Tiburon Laboratory employees to discuss the Civil Service Reform Act and the Code of Ethics Law.

27 - Roger Green traveled to Oroville, California to service the NMFS Chemical Imprinting System at Feather River Hatchery. He also conferred with the Hatchery Manager on their management of the Laboratory's fish there.

PERSONNEL

April 6 - Francine E. Yagawa, Computer Aid, Resignation - Honolulu Laboratory.

- Philip Unitt, Biological Technician, Resignation - La Jolla Laboratory.

8 - Carol Kimbrell, Fishery Biologist, Reassignment - La Jolla Laboratory.

13 - Charles Hoien, Biological Technician, Resignation - La Jolla Laboratory.

22 - Dale Felbaum, Biological Technician, Promotion - La Jolla Laboratory.

23 - Gail K. Okuda, Data Transcriber, 700-hour Appointment (NTE 9/29) - Honolulu Laboratory.

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